Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings, of the claims in the application:

Claims 1-20 (cancelled).

21. (New) A circuit implementation of a biological neuron, the circuit comprising:

(a) a plurality of neuron circuits each of said plurality of neuron circuits 10a comprising:

a neuron cell membrane circuit; and

a learning circuit coupled to said neuron cell membrane circuit;

a dendrite circuit coupled to said neuron cell membrane circuit;

(b) a synapse circuit coupled to each of said plurality of neuron circuits to provide a path through which said plurality of neuron circuits communicate, said synapse circuit including means for modification of the synaptic conductance said synapse circuit coupled to each of said neurons 10a through the corresponding dendrite circuit 16a.

22. (New) The circuit of Claim 21 wherein said synapse circuit comprises:

a storage element having a first terminal coupled to a first terminal of said synapse circuit and a second terminal coupled to a second terminal of said synapse circuit;

a non-NMDA receptor channel circuit having a first terminal coupled to the first terminal of said synapse circuit and a second terminal coupled to the second terminal of said synapse circuit; and

an NMDA receptor channel circuit having a first terminal coupled to the first terminal of said synapse circuit and a second terminal coupled to the second terminal of said synapse circuit.

23. (New) The integrated circuit of Claim 22 wherein said storage element comprises:

an amplifier; and

a capacitor having a first terminal coupled to an output terminal of said amplifier and to a

first terminal of said temporary storage and buffer circuit and having a second terminal coupled to a first reference potential.

24. (New) The circuit of Claim 23 wherein said synapse circuit is coupled to said cell membrane circuit of said neuron circuit through said dendrite circuit.